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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,427	10/02/2003	Alan R. Arthur	200311615-1	1589

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EXAMINER	
ECHELMEYER, ALIX ELIZABETH	
ART UNIT	**PAPER NUMBER**
1745	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/678,427	ARTHUR, ALAN R.	
	Examiner	Art Unit	
	Alix Elizabeth Echelmeyer	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 May 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27 and 41-55* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27,41-55* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 2, 2007 has been entered.

2. Claims 1 and 41 have been amended. Claims 1-27 and 41-55 are pending and are rejected for the reasons given below.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 6, 9, 10, 41, 42, 45, 47, 49, 50, 52 are rejected under 35 U.S.C. 102(b) as being anticipated by Wheeler et al. (US Patent 4,609,037).

Wheeler et al. teach a variable temperature apparatus for heating and cooling an article (abstract; column 1 lines 56-69). The apparatus consists of a first plate having low heat capacity and a second plate having high heat capacity, which serves as a heat sink (column 1 lines 61-68).

Claims 1 and 41 contain language to an automatic response from the coupling member when the heat generating core reaches a predetermined temperature. The system of Wheeler et al. is automatic, since it is self-acting and self-regulating. According to the Merriam-Webster Dictionary, the adjective automatic describes something having a self-acting or self-regulating mechanism. The system of Wheeler et al. is self-acting, in that one part of the system, the vacuum and spring, acts on another part of the system, the plates, to make the plates come in contact. Further, the system of Wheeler et al. is self-regulating, in that it regulates the temperature of the first plate by applying the second plate as a heat sink to remove heat when the first plate is too hot.

As for claim 52, the apparatus further includes a vacuum between the plates during a heating phase (column 4 lines 26-29).

During the heating phase, the plates do not contact (column 2 lines 22-31). Regarding claims 45, 47 and 50, when the first plate reaches a certain temperature, the vacuum is released and a spring presses the plates closer together to contact the heat sink and the heating core (column 3 lines 32-36). The spring serves as the responsive coupling member of the instant application.

As for claims 6 and 49, the system of Wheeler et al. would inherently have a sensor, since the operation is dependent on the temperature of the wafer chuck. There would have to be a way for the system to determine when to bring the heat sink into contact with the heat generator.

Regarding claims 9 and 10, the heat sink is made of aluminum (column 2 lines 47-49).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler et al. in view of Oishi (JP 03-012998).

The teachings of Wheeler et al. as discussed above are incorporated herein.

Wheeler et al. teach a spring to force the heat sink and heat generating core into contact but fail to teach that the spring is a shape memory alloy.

Oishi teaches two plates serving as heat sinks that are coupled with heat releasing equipment. A shape memory alloy between the two plates is designed to change the heat resistance between the plates based on temperature (abstract). The alloy deforms under certain temperatures, causing the plates to be closer or further apart (see Figures 1 and 2). The plates make contact through the shape memory alloy when the alloy is flat, but are separated when the alloy is in its zig-zag position.

It would be desirable to use the shape memory alloy to contact to the heat sink and heat generator of Wheeler et al. since the action caused by the shape memory allow is easy and responds to temperature conditions (abstract).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to use the shape memory alloy of Oishi in the apparatus of Wheeler et al. since it would ease operation and make the system respond to temperature conditions.

7. Claim 51 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler et al.

The teachings of Wheeler et al. as discussed above are incorporated herein.

Wheeler et al. teach that the spring pushes the plates together after the biasing vacuum is released. Wheeler et al. further teach that a negative vacuum may be applied to push the plates into even closer contact (column 3 lines 38-42).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the spring as the biasing member and the vacuum as the means for contacting the plates, since it would require less energy to keep the plates apart, as the vacuum would not have to be applied since the spring would do the work to keep the plates apart. It has been held that rearranging parts of an invention involves only routine skill in the art. MPEP 2144.04 (VI).

8. Claims 5 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler et al. in view of Higashiyama et al. (US Pre-Grant Publication 2004/0180247).

The teachings of Wheeler et al. as discussed above are incorporated herein.

Wheeler et al. teach a spring to force the heat sink and heat generating core into contact but fail to teach that the spring is a shape memory alloy.

Higashiyama et al. teach a valve that is controlled by a material that changes its shape depending on temperature, such as a bimetal. The opening and closing of the valve is controlled by hardware, reducing temperature variation ([0131]).

It would be desirable to use the bimetal of Higashiyama et al. in the apparatus of Wheeler et al. since it allows the apparatus to be controlled by hardware, reducing temperature variation.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to use the bimetal of Higashiyama et al. in the system of Wheeler et al. since it allows the apparatus to be controlled by hardware, reducing temperature variation.

9. Claims 43 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler et al. in view of Maeda et al. (US Pre-Grant Publication 2001/0023591).

The teachings of Wheeler et al. as discussed above are incorporated herein.

Wheeler et al. teach the variably insulated system, but fail to teach a fan to further cool the system.

Maeda et al. teach a heat sink for cooling the heat generating CPU of a notebook computer. Additionally, a fan is used to cool the heat sink, creating a greater temperature differential between the heat sink and the CPU, making it cool more effectively (abstract; Figure 8; [0014]; [0016]).

It would be desirable to use the fan of Maeda et al. in the heat sink of Wheeler et al. in order to more effectively cool the system.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a fan to cool the heat sink of Wheeler et al. further, as taught by Maeda et al., since the fan would make the heat sink more effective in removing heat from the system.

10. Claims 7, 8, 11, 12, 14, 16, 19, 21, 22, 25, 26, 44 rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler et al. in view of Gillett et al. (US Patent 5,759,278).

The teachings of Wheeler et al. as discussed above are incorporated herein.

Wheeler et al. teach a variably insulated system but do not specifically teach a solid oxide fuel cell may be cooled by the system.

As for claims 16 and 25, the system of Wheeler et al. would inherently have a sensor, since the operation is dependent on the temperature of the wafer chuck. There would have to be a way for the system to determine when to bring the heat sink into contact with the heat generator.

Gillett et al. teach a solid oxide fuel cell capable of operating at temperatures over 650°C (abstract; column 2 lines 46-66). The solid oxide fuel cell is contained within insulating housing to control the temperature, resulting in cost and performance advantages.

The insulating system of Wheeler et al. would further improve the advantages of Gillett et al. but allowing more control over the insulating system, since combining the system of Gillett et al. with the additional heat sink taught by Wheeler et al. would provide added insulation.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the insulating system of Wheeler et al. with the solid oxide fuel cell system of Gillett et al. in order to improve the insulating housing already present in Gillett et al.

11. Claims 13 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler et al. in view of Gillett et al. as applied to claims 11 and 21 above, and further in view of Oishi.

The teachings of Wheeler et al., Gillett et al. and Oishi as discussed above are incorporated herein.

Wheeler et al. in view of Gillett et al. teach a spring to force the heat sink and fuel cell into contact but fail to teach that the spring is a shape memory alloy.

Oishi teaches two plates serving as heat sinks that are coupled with heat releasing equipment. A shape memory alloy between the two plates is designed to change the heat resistance between the plates based on temperature (abstract). The alloy deforms under certain temperatures, causing the plates to be closer or further apart (see Figures 1 and 2). The plates make contact through the shape memory alloy when the alloy is flat, but are separated when the alloy is in its zig-zag position.

It would be desirable to use the shape memory alloy to contact to the heat sink and fuel cell of Wheeler et al. in view of Gillett et al. since the action caused by the shape memory allow is easy and responds to temperature conditions (abstract).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to use the shape memory alloy of Oishi in the apparatus of Wheeler et al. in view of Gillett et al. since it would ease operation and make the system respond to temperature conditions.

12. Claims 15 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler et al. in view of Gillett et al. as applied to claims 11 and 21 above, and further in view of Higashiyama et al.

The teachings of Wheeler et al., Gillett et al. and Higashiyama et al. as discussed above are incorporated herein.

Wheeler et al. in view of Gillett et al. teach a spring to force the heat sink and fuel cell into contact but fail to teach that the spring is a bimetal.

Higashiyama et al. teach a valve that is controlled by a material that changes its shape depending on temperature, such as a bimetal. The opening and closing of the valve is controlled by hardware, reducing temperature variation ([0131]).

It would be desirable to use the bimetal of Higashiyama et al. in the apparatus of Wheeler et al. in view of Gillett et al. since it allows the apparatus to be controlled by hardware, reducing temperature variation.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to use the bimetal of Higashiyama et al. in the system of Wheeler et al. in view of Gillett et al. since it allows the apparatus to be controlled by hardware, reducing temperature variation.

13. Claims 17 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler et al. in view of Gillett et al. as applied to claims 6 and 11 above, and in further view of Louie et al. (US Patent 6,296,032).

The teachings of Wheeler et al. and Gillett et al. as discussed above are incorporated herein.

Neither Wheeler et al. nor Wheeler et al. in view of Gillett et al. teach a solenoid valve for contacting heat sink and heat generator.

Louie et al. teach a solenoid to connect an upper heat sink to a lower heat sink (column 8 lines 53-57).

It would be desirable to use the solenoid of Louie et al. in the apparatus of Wheeler et al. since it allows the apparatus to be controlled by hardware, reducing temperature variation.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to use the solenoid of Louie et al. in the system of Wheeler et al. since it allows the apparatus to be controlled by hardware, reducing temperature variation.

14. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler et al. in view of Gillett et al. as applied to claim 11above, and in further view of Maeda et al.

The teachings of Wheeler et al., Gillett et al. and Maeda et al. as discussed above are incorporated herein.

Wheeler et al. in view of Gillett et al. teach the variably insulated system, but fail to teach a fan to further cool the fuel cell.

Maeda et al. teach a heat sink for cooling the heat generating CPU of a notebook computer. Additionally, a fan is used to cool the heat sink, creating a greater temperature differential between the heat sink and the CPU, making it cool more effectively (abstract; Figure 8; [0014]; [0016]).

It would be desirable to use the fan of Maeda et al. in the heat sink of Wheeler et al. in view of Gillett et al. in order to more effectively cool the system.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a fan to cool the heat sink of Wheeler et al. in view of Gillett et al. further, as taught by Maeda et al., since the fan would make the heat sink more effective in removing heat from the system.

Allowable Subject Matter

15. Claims 18, 27, 46 and 53 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

16. The following is an examiner's statement of reasons for allowance: the prior art fails to teach or render obvious a shape memory alloy strung between a plurality of posts to force contact between a heat sink and heat generating core.
Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

17. Applicant's arguments filed May 2, 2007 have been fully considered but they are not persuasive.

On page 11 of the Remarks, Applicant discuss what a heat generating core, as described in the instant specification is. Specifically, according to Applicant, a heat generating core "may be any heat generating device that functions with increased performance depending on the point of operation of the heat generating device." Applicant has argued that the first plate of Wheeler et al. does no serve as a heat generating core but do not offer evidence of why it does not. In fact, as described in the disclosure of Wheeler et al., the first plate does operate more efficiently at a higher temperature, since the plate has time-proportioning circuitry (column 3 lines 58-61). In other words, instead of heating all at once, the heating can be controlled "to regulate the current and prevent temperature overshoot and fluctuation."

Next, Applicant argues that the system of Wheeler et al., which creates space between the heat generating core and the heat sink while the heat generating core is below a certain temperature and then brings them into contact to allow the heat sink to remove heat from the heat generating core when the heat generating core is above a certain temperature, is entirely different from the Applicant's claimed subject matter. The examiner disagrees, since the claimed invention provides "contact between [the] heat generating core and [the] heat sink at a predetermined temperature of said heat generating core such that heat from said heat generating core is dissipated by said heat sink when said heat generating core and said heat sink are in contact..." (claim 1 of instant application). Applicant has not explained how these mechanisms are different.

Regarding Applicant's argument, on pages 12-13 of the Remarks, that Wheeler does not suggest that the system is responsive to temperature, the examiner strongly disagrees. The purpose of the system of Wheeler et al. is to remove heat from the first plate when the first plate is above a certain temperature.

Next, Applicant argues that the heat responsive coupling member, or spring and vacuum system, of Wheeler et al., is not "activated" to cause relative movement. The removal of a vacuum to separate the two plates "activates" the spring to couple the two plates.

The examiner believes that this coupling is automatic, as required in the newly amended claims 1 and 41. According to the Merriam-Webster Dictionary, the adjective automatic describes something having a self-acting or self-regulating mechanism. The system of Wheeler et al. is self-acting, in that one part of the system, the vacuum and

spring, acts on another part of the system, the plates, to make the plates come in contact. Further, the system of Wheeler et al. is self-regulating, in that it regulates the temperature of the first plate by applying the second plate as a heat sink to remove heat when the first plate is too hot.

As for the arguments on page 14 of the Remarks concerning a bias to physically separate the heat sink from the heat generating core, the examiner views the bias as a vacuum, since it physically separates the two plates of Wheeler et al. that correspond to the heat sink and heat generating core of the instant application.

As for the arguments concerning claim 52 on page 15 of the Remarks, Wheeler teaches that the space between the plates, or chamber, may be evacuated (see above, also column 4 lines 26-29 of Wheeler et al.).

On pages 16 and 17, Applicant argues that the vacuum of Wheeler et al. brings the plates into contact. While a vacuum may be applied to the plates after they are in contact, another vacuum is used to separate the plates. This is clear from the final sentence of the abstract of Wheeler et al., which states; "vacuum suction in the chamber *retracts the second plate from the first*" (emphasis added). As for the statement in the third full paragraph that "it would be untenable to suggest that the support member of Oishi" can be incorporated into the system of Wheeler et al., applicants offer no reason why the combination is "untenable." The rejection is upheld.

On page 18, Applicants argue that the heat removal system of Wheeler et al. cannot be used with a fuel cell system such as the one of Gillett et al. because the heated device of Wheeler et al. has nothing to do with an electrochemical system. An

electrochemical system, or core, produces heat, as does the heated device of Wheeler et al. If an electrochemical system gets too hot, then heat is removed. The system of Wheeler et al. is designed to remove heat from an object when it has reached a certain temperature. The motivation to use the system of Wheeler et al. with an electrochemical cell is to remove heat from an electrochemical cell.

Further, as argued on page 19 in the first and last full paragraphs, Wheeler et al. do teach that the heat sink and heat generating core are in contact above a certain temperature, as already discussed above.

The statements on page 20-22 do not provide arguments beyond those already discussed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is 571-272-1101. The examiner can normally be reached on Mon-Fri 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's trainer, Susy N. Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Alix Elizabeth Echelmeyer
Examiner
Art Unit 1745

aee

SUSY TSANG-FOSTER
PRIMARY EXAMINER